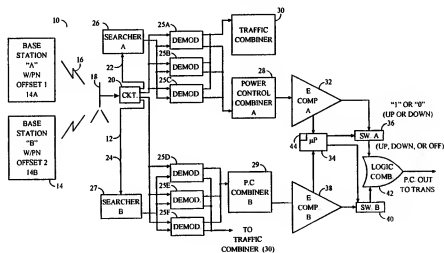




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup>:</b> <b>H04B 7/005, 1/707</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 99/10985</b> <b>(43) International Publication Date:</b> 4 March 1999 (04.03.99)
<b>(21) International Application Number:</b> PCT/US98/17528 <b>(22) International Filing Date:</b> 24 August 1998 (24.08.98) <b>(30) Priority Data:</b> 08/919,806 29 August 1997 (29.08.97) US <b>(71) Applicant:</b> QUALCOMM INCORPORATED [US/US]; 6455 Lusk Boulevard, San Diego, CA 92121 (US). <b>(72) Inventors:</b> SAINTS, Keith, W.; Apartment 4212, 7160 Shoreline Drive, San Diego, CA 92122 (US). TIEDEMANN, Edward, G., Jr.; 4350 Bromfield Avenue, San Diego, CA 92122 (US). <b>(74) Agents:</b> MILLER, Russell, B. et al.; Qualcomm Incorporated, 6455 Lusk Boulevard, San Diego, CA 92121 (US).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BI, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <b>(88) Date of publication of the international search report:</b> 27 May 1999 (27.05.99)

**(54) Title: METHOD AND APPARATUS FOR PROCESSING POWER CONTROL SIGNALS IN A MOBILE TELEPHONE SYSTEM****(57) Abstract**

The transmitted power of a mobile telephone (12) is established by power control bits that are transmitted in a traffic channel from a base station (14A, 14B) and that are demodulated by a rake receiver (22, 24) in the telephone. The rake receiver includes a plurality of demodulators (25a to 25f) that demodulate respective fingers of the traffic channel which may be caused by multipath conditions, with the power control bits from each demodulator being combined with the power control bits of the other demodulators in the rake receiver regardless of whether the demodulators (25a to 25f) are in lock with their respective fingers. The combined power control signal from a rake receiver (22, 24) associated with a first base station (14A, 14B) is then tested against a threshold. If the combined power is at least equal to the threshold, the combined power control signal is sent to a logic combiner (42). If other base stations are communicating with the mobile telephone, the combined power control signal from each of these other base stations is also sent to the logic combiner (42). If any power control signal commands the mobile telephone to decrease its transmitted power, it does so; otherwise, it increases its transmitted power. Alternatively, the power control bits from each demodulator in a rake receiver (22, 24) can be blocked if the finger energy falls below a threshold that depends on the number of fingers from the associated base station.

*FOR THE PURPOSES OF INFORMATION ONLY*

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakhstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 H04B7/005 H04B1/707

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X  A	<p>WO 95 08901 A (NOKIA TELECOMMUNICATIONS OY ;JOLMA PETRI (FI); UOLA RISTO (FI)) 30 March 1995 see abstract</p> <p>see page 1, line 5-17 see page 2, line 16 - page 3-30 see page 4, line 20 - page 5, line 16 see page 7, line 19-26 see page 8, line 27 - page 9, line 25 see figures see claims</p> <p style="text-align: center;">--- -/-</p>	<p>11</p> <p>1-10, 12-35</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 March 1999	31/03/1999
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Dejonghe, O

## INTERNATIONAL SEARCH REPORT

Int. Application No.

PCT/US 98/17528

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 640 414 A (BLAKENEY II ROBERT D ET AL) 17 June 1997  see column 12, line 7-24  see column 12, line 58 - column 13, line 19  see column 13, line 58 - column 14, line 5  see column 28, line 3-17  see figures 1,2  ---</p>	1-35
A	<p>EP 0 671 819 A (ROKE MANOR RESEARCH) 13 September 1995  see abstract  see column 1, line 1-46  see column 2, line 16-47  see column 4, line 6-56  see figure 3  see claims 1,3,4,7  ---</p>	1-35
A	<p>EP 0 680 160 A (NIPPON TELEGRAPH &amp; TELEPHONE) 2 November 1995  see abstract  see column 2, line 34 - column 5, line 34  see column 8, line 28 - column 9, line 20  see claims  ---</p>	1-35
A	<p>US 5 056 109 A (GILHOUSEN KLEIN S ET AL) 8 October 1991  cited in the application  see abstract  see column 5, line 66 - column 6, line 13  see column 6, line 63 - column 7, line 50  see column 13, line 1-30  see column 13, line 45 - column 14, line 3  see column 14, line 42 - column 15, line 59  see figures 1,4,5  -----</p>	1-35

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/17528

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9508901	A	30-03-1995	FI 934113 A AU 673464 B AU 7658894 A CN 1116033 A EP 0670098 A JP 8503833 T NO 952002 A US 5652748 A	21-03-1995 07-11-1996 10-04-1995 31-01-1996 06-09-1995 23-04-1996 13-07-1995 29-07-1997
US 5640414	A	17-06-1997	US 5267261 A	30-11-1993
EP 0671819	A	13-09-1995	GB 2287379 A CA 2142066 A FI 951107 A US 5574972 A	13-09-1995 11-09-1995 11-09-1995 12-11-1996
EP 0680160	A	02-11-1995	JP 8018503 A CA 2147922 A CN 1115555 A	19-01-1996 28-10-1995 24-01-1996
US 5056109	A	08-10-1991	AT 163822 T AU 646001 B AU 6728390 A CA 2072989 A CN 1053870 A,B CN 1090107 A,B CN 1159720 A DE 69032105 D DE 69032105 T EP 0500689 A ES 2113862 T FI 922083 A GR 3026454 T IL 96218 A JP 2776632 B JP 4502841 T MX 172367 B NO 304206 B SG 48360 A WO 9107037 A US 5485486 A US 5265119 A US 5257283 A US 5267262 A	15-03-1998 03-02-1994 31-05-1991 08-05-1991 14-08-1991 27-07-1994 17-09-1997 09-04-1998 08-10-1998 02-09-1992 16-05-1998 07-05-1992 30-06-1998 27-02-1994 16-07-1998 21-05-1992 14-12-1993 09-11-1998 17-04-1998 16-05-1991 16-01-1996 23-11-1993 26-10-1993 30-11-1993